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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 09/853,883 | 05/10/2001 | Tina Abrahamsson | 020184000200 | 6147 |

20350 7590 11/22/2004

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| EXAMINER | |
|---|---|
| PHAN, MAN U | |
| **ART UNIT** | **PAPER NUMBER** |
| 2665 | |

DATE MAILED: 11/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 09/853,883 | ABRAHAMSSON ET AL. | |
| | Examiner | Art Unit | |
| | Man Phan | 2665 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *10 May 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,4,6-9,14-16,18-23 and 28-30* is/are rejected.

7)☒ Claim(s) *3,5,10-13,17,19 and 24-27* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *10 May 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

*DETAILED ACTION*

1. The application of Abrahamsson et al. for a "Encoding and decoding of a digital signal" filed 05/10/2001 has been examined. This application claims foreign priority based on the application SE 0001728-5 filed May 10, 2000 in Sweden. Receipt is acknowledged of papers submitted under 35 U.S.C 119(a) – (d), which papers have been placed of record in the file. Claims 1-30 are pending in the application.

***Claim Rejections - 35 USC ' 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by prior art under 35 U.S.C. 103(a).

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

invention was made in order for the examiner to consider the applicability of 35 U.S.C. 1038 and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1, 2, 4, 6-9, 14-16, 18, 20-23, 28-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin et al. (US#6,006,174) in view of Fuchigami et al. (US#6,463,410).

With respect to claims 1 and 15, Lin et al. (US#6,006,174) and Fuchigami et al. (US#6,463,410) disclose a method of encoding/decoding digital signals utilizing the quantizations of generated prediction samples, according to the essential features of the claims. Lin et al. discloses a method for encoding/decoding speech, comprising the steps of digitizing an original speech, partitioning the digitized signal into a number of samples, pre-emphasizing the samples, producing linear predictive reflection coefficients from the samples, quantizing these reflection coefficients, converting the quantized reflection coefficients to spectral coefficients and subjecting the spectral coefficients to pitch analysis to obtain a spectral residual signal (See Figs. 1 & 5; the Abstract and Col. 8, lines 22 plus).

However, Lin et al. does not expressly disclose the lossless encoding/decoding process for the quantized digital samples. In the same field of endeavor, Fuchigami et al. teaches a system and method for audio encoding/decoding using lossless encoding and decoding techniques. Fuchigami discloses in Fig. 1 is a block diagram illustrated an audio signal encoding 100 includes a channel correlation circuit "A" and a lossless encoder 2D. An audio signal decoding 200 includes a channel correlation circuit "B" and a lossless decoder 3D. As shown in Fig. 2, the lossless encoder 2D includes a buffer (a memory) 10. A sequence of samples of the addition-result signal (L+R) and a sequence of samples of the subtraction-result signal (L-R) are

applied to the buffer 10. The addition-result signal (L+R) and the subtraction-result signal (L-R) are stored into the buffer 10 frame by frame. Every frame is composed of a predetermined number of successive samples (Col. 7, lines 13 plus).

Regarding claims 2, 4, 7-9, 14 and 16, 18, 21-23, 28, Lin et al further teaches in Fig. 1 a block diagram of an 8 kbps multipulse LPC speech coder 10, in which the original speech is digitized using sample/hold and A/D circuitry 44 comprising a sample and hold block 46 and an analog to digital block 48. (Fig. 2). The sampling rate is 8 kHz. The digitized speech signal, s(n), is analyzed on a block basis, meaning that before analysis can begin, N samples of s(n) must be acquired. Once a block of speech samples s(n) is acquired, it is passed to the preemphasis filter 12 which has a z-transform function. It is then passed to the LPC analysis block 14 from which the signal K is fed to the reflection coefficient quantizer and LPC converter whitening block 20, (shown in detail in Fig. 3). The LPC analysis block 14 produces LPC reflection coefficients which are related to the all-pole filter coefficients. The reflection coefficients are then quantized in block 20 in the manner shown in detail in Fig. 5 wherein two sets of *quantizer tables* (for quantization level loop up) are previously stored. One set has been designed using training databases based on voiced speech, while the other has been designed using unvoiced speech. The reflection coefficients are quantized twice; once using the voiced quantizer 48 and once using the unvoiced quantizer 50. Each quantized set of reflection coefficients is converted to its respective spectral coefficients, as at 52 and 54, which, in turn, enables the computation of the log-spectral distance between the unquantized spectrum and the quantized spectrum. The set of quantized reflection coefficients which produces the smaller log-spectral distance shown at 56, is then retained. The retained reflection coefficient parameters are encoded for transmission and also

converted to the corresponding all-pole LPC filter coefficients in block 58 (See also Fig. 12; Col. 2, lines 22 plus and Col. 9, lines 9 plus).

With respect to claims 29, 30, These claims differ from claims Lin in view of Fuchigami in that the claims recited a computer program product for performing the same basis of steps and apparatus of the prior arts as discussed in the rejection of claims 1 and 15 above. It would have been obvious to a person of ordinary skill in the art to implement a computer program product in Lin in view of Fuchigami for performing the steps and apparatus as recited in the claims with the motivation being to provide an efficient enhancement to the encoding/decoding of digital samples in packet switched network, and easy to maintenance, upgrade.

One skilled in the art would have recognized the need for effectively and efficiently encoding/decoding of digital samples of speech signal using filtering process, and would have applied Fuchigami's novel use of the lossless encoding and decoding techniques into Lin's teaching of the encoding/decoding speech in packet switched communication. Therefore, It would have been obvious to a person of ordinary skill in the art at the time of the invention was made to apply Fuchigami's audio signal processing apparatus into multiple impulse excitation speech encoder and decoder with the motivation being to provide a method and system for encoding/decoding of digital signal in a packet switched network.

5. Claims 6 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin et al. (US#6,006,174) in view of Fuchigami et al. (US#6,463,410) as applied to the claims above, and further in view of Lee et al.(US#5,511,094).

With respect to claims 6 and 20, Lin et al. and Fuchigami et al. disclose the claimed limitations discussed in paragraph 4 above. However, Lin et al. and Fuchigami et al. do not expressly disclose the step of de-quantization of of the quantized digital samples resulting from the lossless decoding. In the same field of endeavor, Lee et al. (US#5,511,094) teaches a signal processor for a sub-band coding system includes a selector receiving various data, i.e., sample data, allocation information, synchronization and system information during encoding, changing the various data into appropriate forms for efficient encoding the various data and generating same, a memory temporarily storing various data received from the selector, an operator for selectively scaling and quantizing sample data and dequantizing and descaling encoded data, classifier providing outputting the operated data, allocation information input to the operating means, and system information as encoded data in accordance with the frame format of a general sub-band coding system, or receiving and classifying the encoded data into system information, allocation information and operated data, and a control signal generator for generating control signals for controlling the encoding and decoding of the selector, memory, operator and classifier circuits. Therefore, since encoding and decoding are performed with a single signal processor circuit, the circuitry advantageously can be simplified (See Fig. 2; Col. 2, lines 18 plus).

One skilled in the art would have recognized the need for effectively and efficiently encoding/decoding of digital samples of speech signal using filtering process, and would have applied Lee's dequantization of of the quantized digital samples, and Fuchigami's novel use of the lossless encoding and decoding techniques into Lin's teaching of the encoding/decoding speech in packet switched communication. Therefore, It would have been obvious to a person of

ordinary skill in the art at the time of the invention was made to apply Lee's signal processor for a sub-band coding system, and Fuchigami's audio signal processing apparatus into multiple impulse excitation speech encoder and decoder with the motivation being to provide a method and system for encoding/decoding of digital signal in a packet switched network.

### *Allowable Subject Matter*

6. Claims 3, 5, 10-13 and 17, 19, 24-27 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

7. The following is an examiner's statement of reasons for the indication of allowable subject matter: The closest prior art of record fails to disclose or suggest wherein table look-ups are performed with a quantized digital sample for generating two quantization region boundary levels corresponding to the quantized digital sample, wherein the leveks with the common generated prediction value and another table are mapped onto a pair of likelihood values that are used for lossless encoding the quantized digital sampl; wherein the table with code words is chosen among several tables with code words based upon the generated prediction sample, and the specific entry is derived as the entry corresponding to the quantization index of the quantized digital samples, as specifically recited in the claims 3, 5 and 17, 19. The prior art of record fails to disclose or suggest wherein the encoding is performed by a multiple description encoder, which multiple description encodes each block of the blocks of digital samples with multiple

block description by performing the steps of encoding method individually for each generated block description, as recited in claims 10-13, 24-27.

8. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

## *Conclusion*

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The Craven et al. (US#6,664,913) is cited to show the lossless coding method for waveform data.

The Agassy et al. (US#6,424,940) is cited to show the method and system for determining gain scaling compensation for quantization.

The Adelmann et al. (US#4,726,019) is cited to show the digital encoder and decoder synchronization in the presence of late arriving packets.

The Ayanoglu et al. (US#5,528,625) is cited to show the high speed quantization level sampling modem with equalization arrangement.

The Ramaswamy et al. (US#6,009,387) is cited to show the system and method of compression/decompressing a speech signal by using split vector quantization and scalar quantization.

The Lozach (US#5,583,963) is cited to show the system for predictive coding/decoding of a digital speech signal by embedded code adaptive transform.

10. Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231 ***or faxed to***:

(703)308-9051, (for formal communications intended for entry) ***or:***

(703)308-5399, (for informal or draft communications, please label "PROPOSED" or "DRAFT"

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystals Drive, Arlington, VA., Sixth Floor (Receptionist).

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to M. Phan whose telephone number is (571) 272-3149.

The examiner can normally be reached on Mon - Fri from 6:30 to 3:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy Vu, can be reached on (571) 272-3155. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571) 272-2600.

MPhan

11/05/2004

Man U. Phan

MAN U. PHAN
PRIMARY EXAMINER